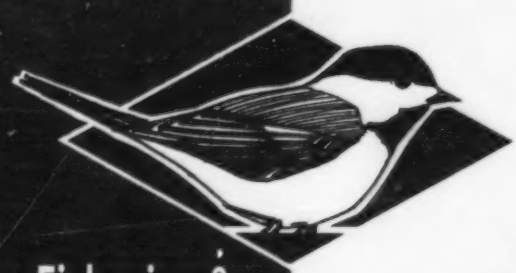

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RESOURCE STATUS AND ASSESSMENT BRANCH

# Colonial Nesting Waterbird Survey in the Northwest Boreal Region - 2000

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Alberta Species at Risk Report No. 7

Alberta
SUSTAINABLE RESOURCE DEVELOPMENT

# Colonial Nesting Waterbird Survey in the Northwest Boreal Region - 2000

M. P. Hanneman

And

M. D. Heckbert

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## DISCLAIMER

The views and opinions expressed are those of the author(s) and do not necessarily represent the policies or positions of the Department or the Alberta Government.

## 1.0 INTRODUCTION

Colonial nesting waterbirds are very unique in their nesting habits. Only specific sites are suitable for nesting to facilitate protection from predators and isolation from human development (Semenchuk 1992). Islands are frequently chosen to nest at because they provide both protection and isolation (Alberta Environment 1995; Stokes and Stokes 1989). Colonies such as great blue heron rookeries may nest in tall trees, which may be used for decades (Stokes and Stokes 1989). Some species may also nest in the cover of reed beds and other vegetation (Baicich and Harrison 1997) for protection from predators. All species of colonial waterbirds are associated with water and many sites are shared between species, creating communities of several colonies (Poston *et al* 1990).

By nesting together, in colonies, these birds can provide protection from predators or warn each other of oncoming danger (Brechtel 1981). However, there are potential dangers to nesting in colonies. Colonial species are particularly vulnerable to site-specific disturbance and habitat changes (Jurick 1985 in Poston *et al* 1990). For instance, American white pelicans have a low tolerance of human disturbance and are susceptible to loss of both breeding and feeding areas (Findholt and Diem 1988). Individuals or the entire colony may be jeopardised and local populations could be significantly lowered (Alberta Environment 1995). Great blue heron nest and colony abandonment increases with increased human presence (Butler 1992). However, colonial species can adapt by colonizing suitable new habitat or recolonizing areas that have regenerated – often because of restored water levels and reduced human disturbance (Poston *et al* 1990)

Provincially, black terns are ranked as a sensitive species (Yellow A) while American white pelican, great blue heron, double-crested cormorants, western grebe, and Forster's tern are also ranked as sensitive species (Yellow B) (Alberta Environment 1996). Species on the Yellow List "…are not currently believed to be at risk, but may require special management to address concerns related to naturally low populations, limited provincial distributions, or demographic/life history features that make them vulnerable to human-related changes to the environment." (Alberta Environment 1996). A new status of Alberta wildlife document is currently being prepared.

Wildlife management agencies need current knowledge on colony locations, status and trends of colonial nesting waterbirds to assist them in making decisions about protection through population and land use management. Colonial waterbird nesting habitats have also received public concern especially for the American white pelican, great blue heron and double-crested cormorant species (Brechtel 1981). Surveys would provide status and trends to assist with ongoing management to address this concern.

This survey was conducted to obtain data on location and status of colonial waterbirds in the Northwest Boreal Region in recognition of their sensitivity and public concern. The survey results have been provided to Natural Resources Service (NRS) wildlife biologists and entered into the Biodiversity/Species Observation Database (BSOD) so that appropriate management strategies can be implemented. Crown lands that contain waterbird colonies will be recommended for protection from disturbances through the application of appropriate protective notations (PNTs) or seasonal sanctuaries.

## 2.0 METHODS

A compilation of historical data on colonial nesting waterbirds for the Northwest Boreal Region was completed before surveying started. Information on historical colony locations was derived from several sources (Brechtel 1981, Markham 1978 and Cottonwood Consultants Ltd. 1999). Area and District NRS, Ducks Unlimited Canada, and Albert Conservation Association offices were also contacted for files or information. BSOD was also queried for colony locations. A master list of active and historic locations was developed in order to plan surveys. A data form was produced to record site information for specific colonial nesters observed (Appendix 1).

Surveys were conducted from June 15, 2000 to July 27, 2000 on a total of 36 waterbodies (Table 1). The waterbodies to be surveyed were prioritised. Those sites that were known historical colonial nester locations and waterbodies that held high potential for colonies due to suitable habitat or individual bird sightings, held the highest priority.

The target species were American white pelicans, double-crested cormorants, and great blue herons. Table 2 shows the list of species recorded during the 2000 survey. Target species along with all other colonial nester locations, incidental and known, (i.e. gulls, terns, and grebes) were recorded while surveying.

A combination of aerial and ground surveys were used to search for nesting birds. Aerial surveys were conducted using rotary-winged aircraft (Bell 206 B Jet Ranger or Robertson 44), and/or fixed-wing aircraft (Cessna 185 on floats or Cessna 210).

The 206 B was flown on July 4 for 5.6 hours and on July 14 for 2.0 hours in the High Prairie area for a total of 7.6 hours. The Cessna 185 was used to survey the Wabasca area on July 5$^{th}$ for a total of 4.0 hours. The Cessna 210 was flown from Peace River on June 26$^{th}$ and completed the Grande Prairie/Peace River areas for a total of 5.0 hours. The R 44 was used to survey the Hay/Zama complex for a total 2.3 hours.

**Table 1** Waterbodies surveyed in the Northwest Boreal Region, 2000.

| Lake | Date | Method | Lake | Date | Method |
|---|---|---|---|---|---|
| Utikuma | 15-Jun-00 | Airboat | Lesser Slave | 04-Jul-00 | R/W Aircraft |
| Ferguson | 22-Jun-00 | Ground | Lesser Slave | 06-Jul-00 | Canoe |
| Kleskun | 23-Jun-00 | Ground | Maurice | 04-Jul-00 | R/W Aircraft |
| Bear | 26-Jun-00 | F/W Aircraft | Mcleod | 05-Jul-00 | F/W Aircraft |
| Big Stoney | 26-Jun-00 | F/W Aircraft | Big Island | 05-Jul-00 | F/W Aircraft |
| George | 26-Jun-00 | F/W Aircraft | Orloff | 05-Jul-00 | F/W Aircraft |
| Kamisak | 26-Jun-00 | F/W Aircraft | Otter | 05-Jul-00 | F/W Aircraft |
| Horse | 26-Jun-00 | F/W Aircraft | Pelican | 05-Jul-00 | F/W Aircraft |
| Albright | 26-Jun-00 | F/W Aircraft | Rock Island | 05-Jul-00 | F/W Aircraft |
| Chalmers | 26-Jun-00 | F/W Aircraft | Sandy | 05-Jul-00 | F/W Aircraft |
| Caron | 26-Jun-00 | F/W Aircraft | South Wabasca | 05-Jul-00 | F/W Aircraft |
| Hay | 26-Jun-00 | F/W Aircraft | Pastecho | 05-Jul-00 | F/W Aircraft |
| Kakut | 26-Jun-00 | F/W Aircraft | Mistehae | 05-Jul-00 | F/W Aircraft |
| McNaught | 26-Jun-00 | F/W Aircraft | Cardinal | 07-Jul-00 | Airboat |
| Sinclair | 26-Jun-00 | F/W Aircraft | Figure Eight | 11-Jul-00 | Ground |
| Winagami | 28-Jun-00 | Airboat | Snipe | 12-Jul-00 | Airboat |
| Winagami | 04-Jul-00 | R/W Aircraft | Wadlin | 20-Jul-00 | Airboat |
| Winagami | 14-Jul-00 | R/W Aircraft | Duck | 27-Jul-00 | R/W Aircraft |
| Buffalo Bay | 04-Jul-00 | R/W Aircraft | North Zama | 27-Jul-00 | R/W Aircraft |
| Heart River Dam | 04-Jul-00 | R/W Aircraft | Sand | 27-Jul-00 | R/W Aircraft |
| Iroquois | 04-Jul-00 | R/W Aircraft | South Zama | 27-Jul-00 | R/W Aircraft |

The waterbody perimeter or portions of it were flown to search for previously unknown colonies while historical sites were surveyed to update their habitat and population status. Colonies that were too large to count or could not be positively identified from the air were, if possible, revisited by ground.

Ground surveys were accomplished using an airboat, canoe, or on foot. An airboat was used to search the perimeter of the lakes where access facilitated launching. Only known locations were surveyed on foot.

In cases where nests were in eggs, a nest count was taken. A total count of fledged young was taken when they were old enough to leave their nests and when nests were no longer visible or deteriorated. Table 1 shows what survey method was used at each waterbody.

Locations were recorded using a handheld Garmin 12XL GPS. A spotting scope and binoculars aided in recording colonies from a distance. A Pentax 35mm camera was used to document photos of the colonies (Photos can be viewed at the Peace River NRS office). Nestlings and eggs were identified using field guides (Baicich and Harrison 1997) and personal knowledge and adult breeding pairs were confirmed using personal knowledge and field guides (Robbins *et al* 1983)

Mapping the colony locations was completed in ArcView. Satellite imagery maps of each location were also created The regional and detailed maps can be viewed at the Peace River NRS office. These maps may be used in future surveys for available access points and providing visual aids for locating the colonies.

The nesting sites for each colony were registered in BSOD. BSOD locations were entered in the project named Colonial Nesters Data Compilation-Northwest Boreal Region. The amendment or application of the Protective Notation (PNT) 452-3 (Colonial Nester Habitat Protection Area) was requested from the land manager (Public Lands in the White Area and Land and Forest Service in the Green Area) on any lands that held a colony.

**Table 2** Species recorded during 2000 survey.

| **Species Common Name** | **Scientific Name** | **Code** |
|---|---|---|
| American White Pelican | *Pelecánus erythrorhýnchos* | AWPE |
| Double-Crested Cormorant | *Phlacrócorax auritus* | DCCO |
| Great Blue Heron | *Árdea heródias* | GBLH |
| Common Tern | *Stérna paradisaéa* | COTE |
| Forster's Tern | *Stérna fórsteri* | FOTE |
| Black Tern | *Chlidónias níger* | BLTE |
| Ring-Billed Gull | *Lárus Delawarénsis* | RBGU |
| California Gull | *Lárus califórnicus* | CAGU |
| Franklin's Gull | *Lárus pipíxcan* | FRGU |
| Eared Grebe | *Pódiceps nigricóllis* | EAGR |
| Western Grebe | *Aechmóphorus occidentális* | WEGR |
| Red-Necked Grebe | *Pódiceps grisegéna* | RNGR |

## 3.0 RESULTS

Thirty-six waterbodies were surveyed. A total of 79 colonies containing 12 different species were recorded on 18 waterbodies. This total includes 18 individual black tern colonies found at Snipe Lake. A total of 58 previously unknown colonies and 21 historical colonies were recorded (Table 4). There were 21 historical locations surveyed that are no longer active. General nest population trends with colony status from historical data and 2000 survey data, are shown in Table 6.

There were three sites that held American white pelican colonies: one at Utikuma Lake and two at Pelican Lake. There were also double-crested cormorant colonies at these sites. Two additional colonies, one at Wadlin Lake and one at Ferguson Lake (Table 4) were observed. Seven great blue heron colonies were recorded, none having more than 20 nests (Table 4). Eared grebes had the most number of colonies recorded and all were previously unsurveyed. Red-necked grebes had the least number of colonies (Table 3) and were not found nesting in colonies but rather as single nests on Lesser Slave Lake (Table 4). Table 3 shows colony, nest, fledgling totals and breeding population estimates for each species.

Franklin's gull colonies were the largest single colonies found with the largest colony estimated at 2000 (Table 4). Black tern and Forster's tern colonies were relatively small with a range of 5-30 nests. There were numerous black tern colonies located along the north and south shores of Snipe Lake that were grouped together to produce a single nest count. There were a total of fourteen colonies along the north shore divided in two sectors by three GPS locations and a total of four colonies in the south bay divided in one sector with two GPS locations

Breeding population estimates of each species for the entire Northwest Boreal Region, based on 2000 survey data, was calculated by multiplying the total nest number by two. In cases where only young were counted, the number was divided by the average clutch size for that species and the result was treated as the nest number, assuming there was no juvenile mortality. (Table 3).

American white pelican, double-crested cormorant, and great blue heron, nest numbers from 2000 are compared with recent surveys in 1998 in Table 7. The three active American white pelican colonies have recently shown an overall decline of 23%. Fledgling numbers have decreased on the north island of Pelican Lake by 53%, which is a substantial decrease on such a large colony and contributes to most of the overall decline. There was a 52% decline of American white pelican nests on the south island of Utikuma Lake but fledgling numbers have increased by 32% on the south island of Pelican Lake. Double-crested cormorant nest numbers have more than doubled in the region from 1998 mainly due to the dramatic 1706% increase on the south island of Utikuma Lake. However, numbers are down by 14% on the south island on Pelican Lake and by 68% on Ferguson Lake.

Communities of colonial nesters occurred frequently where habitat selection was similar for each species. Franklin's gull, eared grebe, western grebe, Forster's tern and black tern species could be found nesting together in emergent vegetation. American coots and redhead ducks were also found nesting within these colonies. Communities of ring-billed gulls, California gulls, American white pelicans, double-crested cormorants and common terns were found on island colonies.

On island sites, species were observed to segregate themselves. Most commonly, American white pelicans would dominate the middle of the island on bare and rocky ground, double-crested cormorants would nest to the outside of the island and ring-billed gulls, California gulls, and common terns would nest on the fringes of the island under the cover of vegetation. California and ring-billed gulls were also seen distinctly segregated in different areas of their nesting sites.

Many colonies that were located in the dense cover of bulrushes or other vegetation showed communal nesting or built nests very close together. High densities of nests also made surveying with the airboat dangerous due to the potential for swamping the nests therefore the surveys were limited to wading through the thick emergent vegetation where visibility was reduced. These factors contributed to conservative counts and likely underestimate the total count because of poor visibility. At Pelican and Cardinal Lakes vegetation on emergent ground prevented a complete count of Ring-billed and California Gull nests. Instead of a nest count, a breeding adult count was taken and divided by two, assuming that each pair of adults was nesting.

On numerous occasions there were colonial nesting birds that were foraging or otherwise not nesting that were observed while surveying. A list of these sightings and there locations are shown in Table 5.

**Table 3** Colony, nest, fledgling totals and breeding population estimate, Northwest Boreal Region, 2000.

| Species Name | Total Number of Colonies | Total Nest Count | Total Fledgling Count | Breeding population estimate |
|---|---|---|---|---|
| American White Pelican | 3 | 60 | 1,660 | 1780 |
| Double-Crested Cormorant | 5 | 2,637 | - | 5,274 |
| Great Blue Heron | 7 | 83 | - | 166 |
| Common Tern | 4 | 375 | 18 | 762 |
| Forster's Tern | 4 | 63 | - | 126 |
| Black Tern | 4 | 108 | - | 216 |
| Ring-Billed Gull | 6 | 324 | 193 | 714 |
| California Gull | 5 | 848 | 408 | 1832 |
| Franklin's Gull | 5 | 5,433 | - | 10,866 |
| Eared Grebe | 11 | 1,693 | - | 3,386 |
| Western Grebe | 6 | 1,216 | - | 2,432 |
| Red-Necked Grebe | 2 | 2 | - | 4 |

* One unknown, white-headed gull colony (15 nests) on Orloff Lake and one unknown grebe colony (6 nests) on Winagami Lake are not included.

The time each colony was surveyed resulted in the observation of varying degrees of nest incubation stages, ranging from 3-4 week old fledglings to nests which had still not hatched. California and ring-billed gulls, American white pelicans and double-crested cormorants were among the first to hatch, being 3-4 weeks old by early July. At the same time, grebes, terns, and Franklin's gulls were found in eggs or within one week of hatching. Great blue heros showed asynchronous fledging with colonies found with nestlings 1-4 weeks old, some in eggs, and some old enough to leave nests. The Great blue heron colony at McNaught Lake built seven nests on four manmade platforms constructed on telephone poles and two nests were built in trees. Staff from Ducks Unlimited Canada in Grande Prairie erected the platforms during the winter of 1999/2000 as most of the historical nesting trees had fallen over. A small portion of American white pelicans and double-crested cormorant colonies were also observed to have asynchronous fledging. There was one occurrence on the north island of Pelican Lake in which some American white pelican eggs had just hatched and some were one week old, but the majority were 3-4

weeks old. Asynchronous hatching was observed in 1998 on the south island in Utikuma Lake (M. Heckbert, unpublished data). The double-crested cormorant colony on Wadlin Lake was in eggs on July 20th while all other surveyed colonies were 4-5 weeks old.

Juvenile mortality was moderate at the American white pelican and double-crested cormorant colonies at Pelican and Utikuma Lakes. At least 193 dead double-crested cormorants and 117 dead American white pelicans were recorded on the south island of Pelican Lake. Similar rates of juvenile mortality were seen on the south island of Pelican Lake and Utikuma Lake.

Three double-crested cormorant bands were found on the south island on Pelican Lake. Two of the individuals were banded in 1986 and one was banded in 1984 at Pelican Lake while birds were too young to fly. It is unknown when the birds died. Their certificates are displayed in Appendix 2.

**Table 4** Colony location and size, Northwest Boreal Region, 2000.

| | | Location | | Colony Information | | |
|---|---|---|---|---|---|---|
| **Lake** | **Species AEP** | **Latitude ($^{O}$N)** | **Longitude ($^{O}$W)** | **Nest Count** | **Fledgling Count** | **Adult Count** |
| **Big Island** | GBLH | 56.2142 | 113.1567 | 20 | -- | -- |
| **Ferguson** | CAGU | 55.2680 | 118.8150 | 33 | 175 | -- |
| | DCCO | 55.2680 | 118.8110 | 19 | -- | 38 |
| **Figure Eight** | GBLH | 56.3108 | 117.9106 | 7 | -- | -- |
| **Iroquois** | EAGR | 55.4630 | 116.6234 | 110 | -- | -- |
| | EAGR | 55.4663 | 116.6320 | 126 | -- | -- |
| **Cardinal** | CAGU | 56.2472 | 117.7297 | 150 | -- | 300 |
| | EAGR | 56.2373 | 117.6954 | 23 | -- | -- |
| | EAGR | 56.2507 | 117.7240 | 553 | -- | -- |
| | EAGR | 56.2519 | 117.7900 | 67 | -- | -- |
| | EAGR | 56.2477 | 117.7880 | 87 | -- | -- |
| | EAGR | 56.2421 | 117.7384 | 460 | -- | -- |
| | FRGU | 56.2421 | 117.7384 | 1390 | -- | -- |
| | FRGU | 56.2507 | 117.7240 | 140 | -- | -- |
| | RBGU | 56.2472 | 117.7297 | 100 | -- | 200 |
| | WEGR | 56.2507 | 117.7240 | 15 | -- | -- |
| **Lesser Slave** | CAGU | 55.3887 | 115.9109 | 188 | -- | -- |
| | COTE | 55.3886 | 115.9150 | 180 | -- | -- |
| | GBLH | 55.3158 | 115.6394 | 17 | -- | -- |
| | GBLH | 55.3111 | 115.6542 | 11 | -- | -- |

**Table 4** Continued

| | | Location | | Colony Information | | |
|---|---|---|---|---|---|---|
| **Lake** | **Species AEP** | **Latitude ($^{O}$N)** | **Longitude ($^{O}$W)** | **Nest Count** | **Fledgling Count** | **Adult Count** |
| | RBGU | 55.3885 | 115.9135 | 140 | -- | -- |
| | RNGR | 55.3695 | 115.8764 | 1 | -- | -- |
| | RNGR | 55.3791 | 115.9065 | 1 | -- | -- |
| | WEGR | 55.3892 | 115.9110 | 350 | -- | -- |
| **Maurice** | EAGR | 55.4532 | 116.7432 | 12 | -- | -- |
| **McNaught** | GBLH | 55.1425 | 119.4569 | 8 | -- | -- |
| **North Zama** | COTE | 58.8147 | 119.0748 | -- | 18 | 28 |
| **South Zama** | RBGU | 58.7037 | 119.1005 | -- | 135 | -- |
| **Orloff** | GBLH | 55.3772 | 113.5372 | 15 | -- | -- |
| | --GU[a] | 55.3892 | 113.4858 | 15 | -- | -- |
| **Pelican** | | | | | | |
| -North Island | AWPE | 55.8288 | 113.2427 | -- | 630 | -- |
| | DCCO | 55.8288 | 113.2427 | 635 | -- | -- |
| -South Island | AWPE | 55.7913 | 113.2681 | -- | 1030 | -- |
| | CAGU | 55.7913 | 113.2681 | 297 | -- | 595 |
| | COTE | 55.7913 | 113.2681 | 35 | -- | -- |
| | DCCO | 55.7913 | 113.2681 | 397 | 570 | -- |
| | RBGU | 55.7913 | 113.2681 | 82 | -- | 165 |
| **Rock Island** | | | | | | |
| -North Island | CAGU | 55.5014 | 113.3579 | -- | 233 | -- |
| | RBGU | 55.5033 | 113.3548 | -- | 58 | -- |
| **Snipe** | BLTE[b] | 55.1689 | 116.7735 | 52 | -- | -- |
| | | -55.1434 | 116.8248 | | -- | -- |
| | BLTE[c] | 55.1434 | 116.8248 | 44 | -- | -- |
| | | -55.1254 | 116.8436 | | -- | -- |
| | BLTE[d] | 55.0890 | 116.7594 | 12 | -- | -- |
| | | -55.0853 | 116.7322 | | -- | -- |

**Table 4** Continued

| | | Location | | Colony Information | | |
|---|---|---|---|---|---|---|
| **Lake** | **Species AEP** | **Latitude ($^{O}$N)** | **Longitude ($^{O}$W)** | **Nest Count** | **Fledgling Count** | **Adult Count** |
| **South Wabasca** | EAGR | 55.9464 | 113.8523 | 45 | -- | -- |
| | EAGR | 55.9590 | 113.8455 | 100 | -- | -- |
| | EAGR | 55.9449 | 113.8521 | 110 | -- | -- |
| | FOTE | 55.9449 | 113.8524 | 30 | -- | -- |
| | FOTE | 55.9720 | 113.8550 | 20 | -- | -- |
| **Utikuma** | | | | | | |
| -South Island | AWPE | 55.8056 | 115.3778 | 60 | -- | -- |
| | DCCO | 55.8056 | 115.3778 | 1572 | -- | -- |
| | FRGU | 55.8000 | 115.3778 | 360 | -- | -- |
| | WEGR | 55.7950 | 115.3778 | 40 | -- | -- |
| -North Island | RBGU | 55.9167 | 115.4000 | 2 | -- | -- |
| | FRGU | 55.9167 | 115.4000 | 1543 | -- | -- |
| | WEGR | 55.9180 | 115.4000 | 250 | -- | -- |
| | COTE | 55.9180 | 115.4000 | 160 | -- | -- |
| -East Island | WEGR | 55.8583 | 115.3125 | 550 | -- | -- |
| | FRGU | 55.8583 | 115.3125 | 2000 | -- | -- |
| -Other locations | WEGR | 55.9403 | 115.4286 | 11 | -- | -- |
| **Wadlin** | DCCO | 57.7337 | 115.6635 | 14 | -- | -- |
| **Winagami** | BLTE | 55.6596 | 116.7100 | 8 | -- | 36 |
| | FOTE | 55.6467 | 116.7380 | 8 | -- | 18 |
| | FOTE | 55.6403 | 116.8054 | 5 | -- | 10 |
| | GBLH | 55.6653 | 116.7126 | 10 | -- | - |
| | --GR[e] | 55.6596 | 116.7100 | 6 | 3 | 3 |

[a] Unknown gull
[b] There was a total of eight individual colonies found between these locations
[c] There was a total of six individual colonies found between these locations
[d] There was a total of four individual colonies found between these locations
[e] Unknown grebe

**Table 5** Non-nesting colonial nesting birds observed, Northwest Boreal Region, 2000.

| Waterbody | Location Description | Observation |
|---|---|---|
| Utikuma Lake | Southeast Side of Lake | 11 Great Blue Herons |
| Kleskun Lake | Island in south cell | White-headed Gulls |
| Bear lake | Northwest Bay - Inlet | 1 Great Blue Heron |
| Hay Lake | Island in Middle | White-headed Gulls |
| Kakut Lake | -- | White-headed Gulls |
| Sinclair Lakea | Northwest Island | White-headed Gulls |
| Winagami Lake | Island South of Breakwater | 80 American White Pelicans |
| " | North Shore | Approx. 300 Franklin's Gulls |
| Lesser Slave Lake | L. Grassy Point | 22 American White Pelicans |
| " | Sucker Creek Bay | 6 American White Pelicans |
| Mcleod Lake | -- | 10 American White Pelicans |
| Orloff Lake | Northeast Bay | 260 American White Pelicans |
| " | Northeast Bay | 475 Double-Crested Cormorants |
| Pastecho Lake | Island | 5 American White Pelicans |
| Mistehae lake | -- | 22 American White Pelicans |
| Ferguson Lake | Southwest side of Lake | Approx. 550 Franklin's Gulls |
| Figure Eight Lake | Northeast Bay | 15 Red-Necked Grebes |
| Snipe Lake | South Side of Lake | 9 American White Pelicans |
| Wadlin Lake | Rock Island | 80 American White Pelicans |
| Duck Lake | -- | White-headed Gulls |
| Sand Lake | -- | White-headed Gulls |

**Table 6** Nest population trends of colonial nesting waterbirds in the Northwest Boreal Region.

| Colony Location | Species | Total # of active nests in most recent survey of each time period; ns= no survey data | | | | |
|---|---|---|---|---|---|---|
| | | 1960's | 1970's | 1980's | 1990's | 2000 |
| Big Island Lake | GBLH | ns | ns | ns | ns | 20 |
| Cardinal Lake | EAGR | ns | ns | ns | ns | 1190 |
| | WEGR | ns | ns | ns | ns | 15 |
| | FRGU | ns | ns | ns | ns | 1550 |
| | CAGU | ns | ns | ns | ns | 150 |
| | RBGU | ns | ns | ns | ns | 100 |
| Ferguson Lake | DCCO | ns | ns | ns | 60 | 19 |
| | CAGU | ns | ns | ns | part of 200 | 175* |
| | RBGU | ns | ns | ns | part of 200 | 0 |
| Figure Eight Lake | GBLH | ns | ns | ns | ? | 7 |

**Table 6** Continued

| Colony Location | Species | Total # of active nests in most recent survey of each time period; ns= no survey data | | | | |
|---|---|---|---|---|---|---|
| | | 1960's | 1970's | 1980's | 1990's | 2000 |
| Horse Lakes | | | | | | |
| -Buffalo Bay | CAGU | ns | active | ns | 0 | 0 |
| | RBGU | ns | active | ns | 0 | 0 |
| Iroquois Lake | EAGR | ns | ns | ns | ns | 236 |
| Kleskun Lake | CAGU | ns | 50 pairs | ns | ns | 0 |
| Lesser Slave Lake | | | | | | |
| -Near Joussard | CAGU | ns | active | ns | 0 | 188 |
| | RBGU | ns | active | ns | 0 | 140 |
| | COTE | ns | 0 | ns | 0 | 180 |
| | WEGR | ns | 0 | ns | 0 | 350 |
| -Giroux Bay | WEGR | ns | 400 | ns | ns | 0 |
| -Grouard Channel | CAGU | ns | active | ns | 0 | 0 |
| | RBGU | ns | active | ns | 0 | 0 |
| -Grouard | GBLH | ns | ns | 20 | 0 | 0 |
| Maurice Lake | EAGR | ns | ns | ns | ns | 12 |
| McNaught Lake | GBLH | ns | ns | ns | ? | 8 |
| Hay/Zama Complex | RBGU | ns | ns | ns | ns | 135* |
| | COTE | ns | ns | ns | ns | 18* |
| Orloff Lake | GBLH | ns | 40 | 50 | 20 | 15 |
| | --GU | ns | ns | ns | ns | 15 |
| | DCCO | ns | 0 | 15 | 0 | 0 |
| Pastecho Lake | AWPE | ns | ns | ns | 5(1990) | 0 |
| Pelican lake | | | | | | |
| -North Island | AWPE | ns | ns | Part of 150 | 1328* | 630* |
| | DCCO | ns | ns | Part of 100 | 565 | 635 |
| | GBLH | 35 | 57 | active | 0 | 0 |
| -South Island | AWPE | ns | 225 | Part of 150 | 780* | 1030* |
| | DCCO | 0 | 242 | Part of 100 | 460* | 570* |
| | CAGU | 100-500 | ns | ns | 0 | 297 |
| | RBGU | ns | ns | ns | 200 | 82 |
| | COTE | ns | ns | ns | 0 | 35 |

**Table 6** Continued

| Colony Location | Species | Total # of active nests in most recent survey of each time period; ns= no survey data | | | | |
|---|---|---|---|---|---|---|
| | | 1960's | 1970's | 1980's | 1990's | 2000 |
| Rock Island Lake | CAGU | ns | 0 | ns | Part of 200 | 233* |
| | RBGU | ns | 0 | ns | Part of 201 | 58* |
| | COTE | ns | 0 | ns | 16 | 0 |
| Snipe Lake | BLTE | ns | ns | ns | ns | 108 |
| South Wabasca Lake | COTE | ns | ns | ns | ns | 50 |
| | EAGR | ns | ns | ns | ns | 255 |
| Utikuma Lake | | | | | | |
| -North Island | AWPE | 0 | active | 2(1985) | 0 | 0 |
| | DCCO | 0 | 69 | active | 0 | 0 |
| | CAGU | 500-1000 | ns | ns | 13 | 0 |
| | RBGU | ns | ns | ns | 5 | 2 |
| | FRGU | ns | ns | ns | 0 | 1543 |
| | COTE | ns | ns | ns | 34 | 160 |
| | WEGR | ns | ns | ns | 64 | 250 |
| -South Island | AWPE | 0 | 12 | 17(1985) | 126 | 60 |
| | DCCO | 0 | 20 | 25 | 87 | 1572 |
| | FRGU | ns | ns | ns | 0 | 360 |
| | WEGR | ns | ns | ns | 39 | 40 |
| -East Island | AWPE | 0 | 12 | 129(1980) | 0 | 0 |
| | DCCO | 0 | 0 | 55 | 0 | 0 |
| | FRGU | ns | ns | ns | 0 | 2000 |
| | WEGR | ns | ns | ns | 0 | 550 |
| -Other locations | WEGR | ns | ns | ns | 0 | 11 |
| Wadlin | AWPE | 15 | 19 | ns | ns | 0 |
| | DCCO | 0 | 0 | ns | ns | 14 |
| | RBGU | 0 | 0 | active | ns | 0 |
| | CAGU | 0 | 0 | active | ns | 0 |
| Winagami | GBLH | ns | ns | ns | ns | 10 |
| | FOTE | ns | ns | ns | ns | 13 |
| | BLTE | ns | ns | ns | ns | 8 |
| | COTE | ns | ns | ns | 149 | 0 |
| | CAGU | ns | ns | ns | 122 | 0 |
| | --GR | ns | ns | ns | ns | 6 |

* Fledgling count

**Table 7** Survey comparison for years 1998 and 2000 for American white pelican, double-crested cormorant, and great blue heron, Northwest Boreal Region.

| Species | Waterbody | | Nest Number 1998 | Nest Number 2000 | Survey Contrast |
|---|---|---|---|---|---|
| AWPE | Pelican Lake | North Island | 1328* | 630* | -698 |
| | | South Island | 780* | 1030* | 250 |
| | Utikuma Lake | South Island | 126 | 60 | -66 |
| Total | | | 2234 | 1720 | -514 |
| DCCO | Pelican Lake | North Island | 565 | 635 | 70 |
| | | South Island | 460 | 397 | -63 |
| | Utikuma Lake | South Island | 87 | 1572 | 1485 |
| | Ferguson Lake | | 60 | 19 | -41 |
| Total | | | 1172 | 2623 | 1451 |
| GBLH | Orloff Lake | | 20 | 15 | -5 |
| Total | | | 20 | 15 | -5 |

*Fledgling count.

## 4.0 DISCUSSION

A few historic American white pelican and double-crested cormorant nesting sites were found not active. The north island of Utikuma Lake has not been active for the past few years and may be prone to disturbance because of the close proximity of the Whitefish Lake Indian Reserve and boat traffic. This disturbance could lead American white pelicans and double-crested cormorants to eventually avoid nesting on the island altogether. The island on Wadlin Lake is unfavourable for American white pelicans when water levels are high because of washout by wave action. However, nesting has occurred in the past and about 80 American white pelicans were observed loafing on the island during the survey, so nesting may occur again. The Pastecho Lake and Orloff Lake American white pelicans/double-crested cormorant colonies have not been active for a number of years possibly because of dense vegetation or higher water levels but no definite explanation is known. The east island on Utikuma Lake was thought to have been abandoned because of thick vegetation or coyote predation.

The Great blue heron rookery near the community of Grouard, located on the Kapowe'no First Nation Indian Reserve, appears to have been logged out in 1992 or 1993 and is no longer active. The Great blue heron colony, previously active on the north island of Pelican Lake, may have relocated because only a few large, dead trees are standing and may not be suitable for nesting. American white pelican and double-crested cormorant colonization may have also discouraged nesting, as this rookery became inactive approximately the same time American white pelican and double-crested cormorant colonies were established (1980's). However, this island should also be continually monitored in case of recolonization.

The western grebe colony in Giroux Bay of Lesser Slave Lake may have relocated to the present location at Joussard. The colony size is similar and is only about 16 km west along the south shore of Lesser Slave Lake of the original colony. Increased boat activity from Spruce Point Park Marina and Faust may have encouraged the colony to relocate but the habitat in Giroux Bay seems adequate for nesting grebes and should be monitored in the future. There is considerable power boat traffic near the present colony site at Joussard.

One of the great blue heron colonies near Faust is located on private land. Efforts to obtain the highest level of protection for the nesting habitat should be pursued. History has shown that habitat destruction can be particularly harmful for species tied to a historical nesting location.

The great blue heron rookery at Orloff Lake has shown a steady decline in the number of nests since the 1980's. Some tree cutting has occurred on the island in the past and there is a fairly permanent camp set up on the shore to the west of the rookery and people are often camped there. Additionally, all-weather road access has been developed to within 0.8 km of the lake, facilitating more recreational fishing activity in recent years. Efforts should be made to further investigate the nesting decline and make corrective actions.

Communities of colonial nesters were observed frequently during the surveys and suggest that similar habitat for these species is required for nesting. Subsequently, competition for these areas will most likely occur and limit the size of the individual colony. If nesting sites did not have to be shared between colonies, separate species colonies would most likely be more extensive due to less competition. The segregation of California gulls and ring-billed gulls on the same nesting site provides evidence that their numbers are, in part, determined by competition. On the south island of Utikuma Lake there was a dramatic increase in double-crested cormorant nests and significantly lower numbers of American white pelican nests from previous years. This may indicate that heavy competition by double-crested cormorants for nesting sites may be having a negative impact on American white pelican numbers. Nesting in communities suggests that there are a limited number of areas that nesting can occur, enhancing the importance of their protection.

Red-necked grebes are only semi-colonial nesters (Baicich and Harrison 1997) which explains why only two red-necked grebe nests were found by themselves. Low densities of red-necked grebes are common on lakes in the Northwest Boreal Region and their abundance is likely under-represented in this survey.

The mortality seen on American white pelican and double-crested cormorant colonies may be due to parasites, disease, competition, weather, or predation. These nesting sites are overcrowded and covered in the faeces from many species of birds and in entrails from fish, which make excellent conditions for harbouring disease. Newcastle's virus, avian cholera and botulism are all possible diseases that occur on American white pelican and double-crested cormorant colonies, which can contribute to mortality. Young American white pelicans were observed with Pouch Lice (*Piagetiella peralis)* heavily lining the inside of their mouth, which may make them susceptible to illnesses. Intraspecific competition between young for food from parents may also occur and result in mortality of those less fit (M. Pybus pers. comm. 2000).

The difference in incubation times and hatching dates between species observed in 2000 may be used in scheduling future surveys so that nest counts aren't conflicted by already hatched young and to minimise colony disturbance. Tern, grebe, and Franklin's gull colonies should be surveyed early July and American white pelican, double-crested cormorant , California gull, and ring-billed gulls should be surveyed early to mid June based on our results. At these times the nests were in eggs which made nest counts easier. Unfortunately, great blue herons showed no particular time frame best for surveying because of asynchronous nesting. The difference in incubation time of the Wadlin Lake double-crested cormorant colony compared to their other colonies could be attributed to the northerly location of this colony or because they are known to have variable breeding seasons (Baicich and Harrison 1997). The island at Wadlin Lake is also susceptible to washing out with large wave action and may have destroyed the original nests. Following nest losses, double-crested cormorants may then replace lost clutches (Baicich and Harrison 1997) and hatching would then occur at a later date than the other colonies. The few American white pelican nests on the north island of Pelican Lake that were 3-4 weeks behind the majority of the colony may have been a renesting attempt or may have been first-time nesters.

There are many lakes, waterbodies, and wetlands within the Northwest Boreal that were not surveyed in 2000. Only a limited number of waterbodies were surveyed because of the late start of the project and the narrow time frame in which the birds were nesting. The number of active colonies is, most likely, much higher than the results of the 2000 survey describes and a larger, more extensive survey is required in order to establish more accurate regional population estimates.

During the course of the survey there were a few anecdotal colony locations from several sources that were never investigated because of time constraints. This includes information from ACA and NRS staff. A total of seven great blue heron, one double-crested cormorant, five California gull, and five ring-billed gull locations were discovered after the survey had taken place (Table 8).

The sensitive American white pelican and double-crested cormorant colonies sparked media interest as reporter Joe McWilliams accompanied us during aerial surveys in the Wabasca area. The report resulted in a two-page newspaper article in a Slave Lake newspaper, *The Lakeside Leader,* on Wednesday, July 12, 2000. There was also a very positive public response to the article as Mr. McWilliams indicated that that issue was one of the best selling issues of the year.

**Table 8** Anecdotal colony locations that were not surveyed in 2000, Northwest Boreal Region.

| Species | Waterbody | Location | Last year Surveyed | Nest Status | Authority |
|---|---|---|---|---|---|
| AWPE | Nipisi Lake | NW 15-78-7-W5 | 2000 | possible | M. Heckbert |
| GBLH | Beaverlodge River | | ? | ? | E. Kolodychuk |
| | Utikuma Lake | Southwest side | ns | ? | E. Kolodychuk |
| | Buffalo Bay | SE-20-75-16-W5 | ns | ? | Local observer |
| | South Tea Lake | NW-09-67-07-W5 | 1980 | 6 | Brechtel (1981) |
| | Unnamed Lake | 01-90-15-W5 | 1995 | 30 | B. Wynes |
| | Unnamed Lake | N 56° 33.93' W 115 57.50' | 2000 | +50 | M. Heckbert |
| DCCO | Graham Lake | (~28)-87-04-W4 | 1980 | 2 | Brechtel (1981) |
| CAGU | Bistcho Lake | 01-123-5-W6 | ? | active | Cottonwood Cons. |
| | Lesser Slave Lake | 17-75-13-W5 | 1979 | active | Cottonwood Cons. |
| | Lesser Slave Lake | 22-74-09-W5 | 1979 | active | Cottonwood Cons. |
| | God's Lake | 18?-90-2-W5 | 1991 | 52 | Cottonwood Cons. |
| RBGU | Lesser Slave Lake | 20-73-5-W5 | 1979 | active | Cottonwood Cons. |
| | Lesser Slave Lake | 17-75-13-W5 | 1979 | active | Cottonwood Cons. |
| | Lesser Slave Lake | 22-74-09-W5 | 1979 | active | Cottonwood Cons. |
| | God's Lake | 18?-90-2-W5 | 1991 | 1 | Cottonwood Cons. |

## 5.0 RECOMMENDATIONS

- Future surveys should be started as early as the beginning of June. This time will allow more waterbodies to be surveyed and produce a more accurate record of colonies present. Surveying at this time would also allow American white pelican, double-crested cormorant, ring-billed gull, and California gull colonies to be visited when the nests are in still in eggs.

- Additional time should be given to research a more extensive list of historical, known, and possible sites to survey. Communication between the public and ACA was minimal and more research on past studies could have been performed before fieldwork began.

- All American white pelican colonies should have seasonal sanctuaries placed on them. There are few nesting sites within Alberta and one colony represents a large portion of the breeding population. A seasonal sanctuary may help protect the colony from human disturbance.

- All previously active colonies should be continually monitored in case of recolonization.

- Another complete survey for colonial nesters should be completed in 2005.

- Anecdotal information should also be investigated to confirm colony locations.

- More time should be allotted for aerial surveys. A larger area can be covered in much less time than from the ground and time efficiency is essential for the short nesting period of the colonies. Twelve hours of rotary-winged surveying and twelve hours of fixed-wing surveying is recommended for future Northwest Boreal Region surveys.

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## APPENDIX 1: COLONIAL NESTERS SURVEY DATA FORM

### Colonial Nesters Survey Data Form

Date:_____ Time:_____ Observer(s):_____

Surveying Method: _____

**Species**

Common Name:_____ Scientific Name:_____ AEP code:_____

**Location**

***Longitude:***_____ ***ATS: sec***_____ ***tp***_____ ***rg***_____ ***W***_____ ***UTM:***_____

Latitude:_____

Waterbody:_____ Features: _____

**Number of Nests**

Active:_____ Inactive:_____ Unknown:_____

Type of Nesting Habitat

Description:_____

_____

_____

Number of Adult :_____

Other Associated Species: _____

Reliability of Count: _____excellent _____fair _____poor

Weather: Temperature(°C)_____ Wind (direction and speed)_____

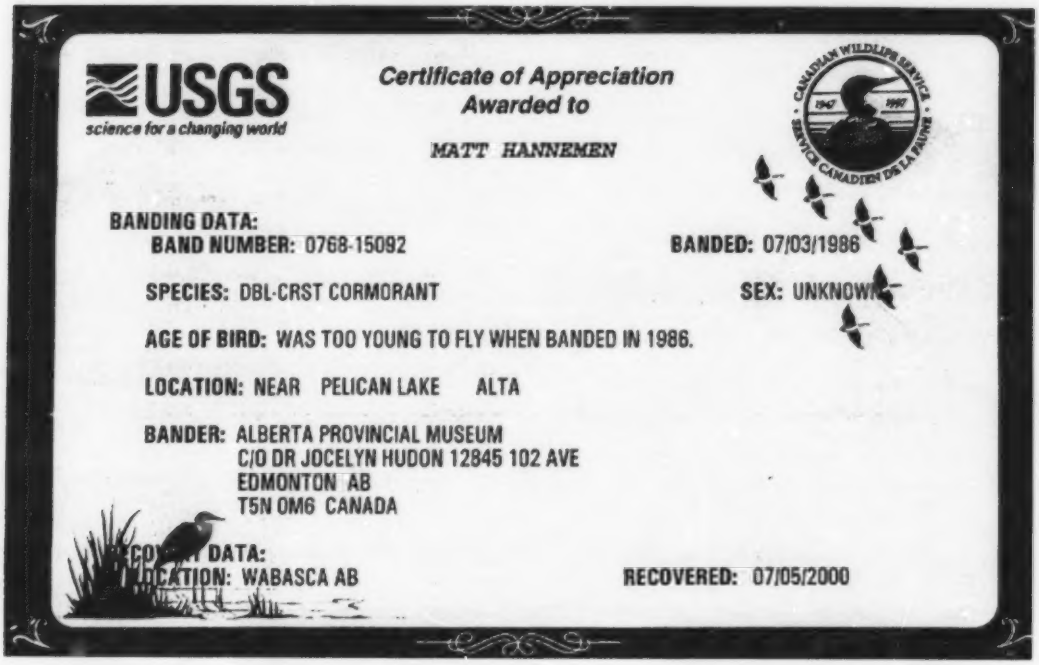
Precipitation_____ Cloud cover (%) _____

Other:_____

Miscellaneous observations and remarks:_____

_____

## APPENDIX 2: RECOVERED BAND CERTIFICATES FOUND ON COLONIAL NESTING WATERBIRD SURVEY, 2000.



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*Awarded to*

*MATT HANNEMEN*

CANADIAN WILDLIFE SERVICE 1947 1997 SERVICE CANADIEN DE LA FAUNE

**BANDING DATA:**
**BAND NUMBER:** 0768-15092 **BANDED:** 07/03/1986

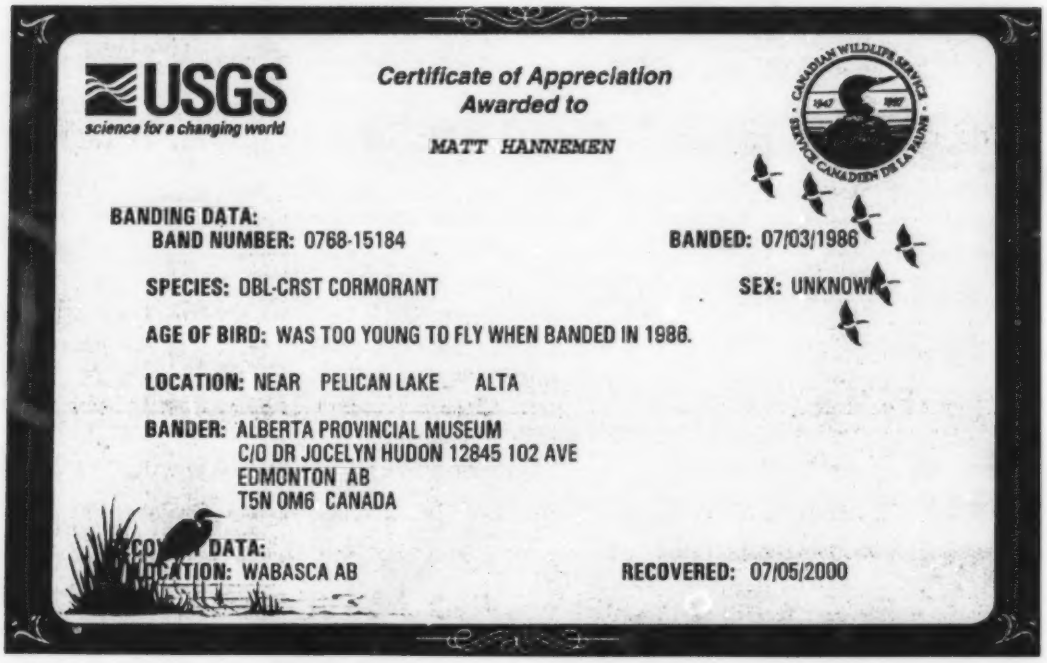
**SPECIES:** DBL-CRST CORMORANT **SEX:** UNKNOWN

**AGE OF BIRD:** WAS TOO YOUNG TO FLY WHEN BANDED IN 1986.

**LOCATION:** NEAR PELICAN LAKE ALTA

**BANDER:** ALBERTA PROVINCIAL MUSEUM
C/O DR JOCELYN HUDON 12845 102 AVE
EDMONTON AB
T5N 0M6 CANADA

**RECOVERY DATA:**
**LOCATION:** WABASCA AB **RECOVERED:** 07/05/2000



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**BANDING DATA:**
**BAND NUMBER:** 0768-15184 **BANDED:** 07/03/1986

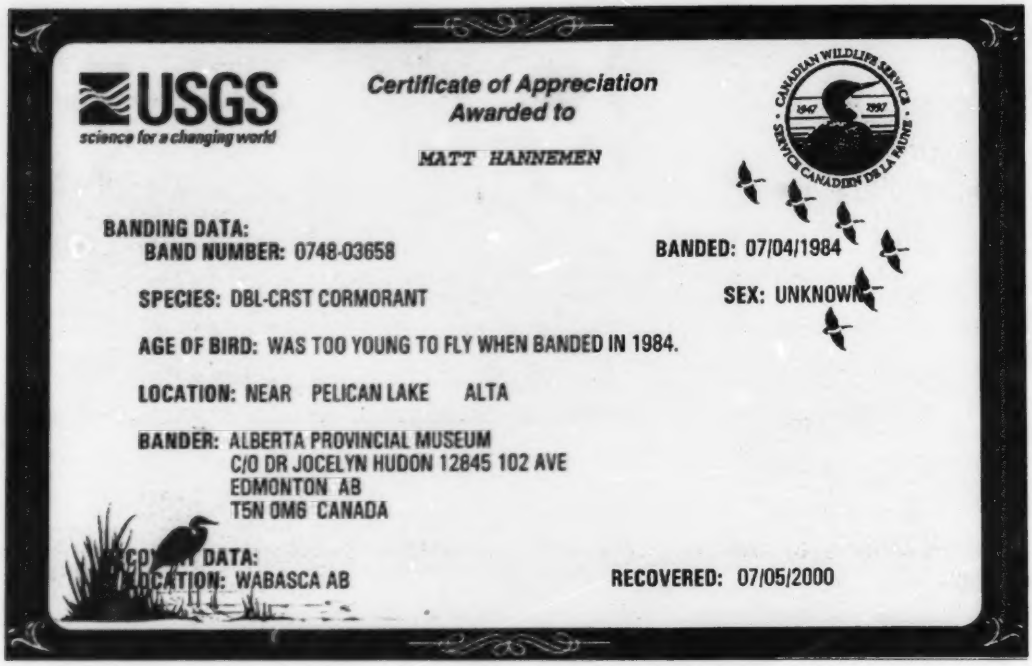
**SPECIES:** DBL-CRST CORMORANT **SEX:** UNKNOWN

**AGE OF BIRD:** WAS TOO YOUNG TO FLY WHEN BANDED IN 1986.

**LOCATION:** NEAR PELICAN LAKE ALTA

**BANDER:** ALBERTA PROVINCIAL MUSEUM
C/O DR JOCELYN HUDON 12845 102 AVE
EDMONTON AB
T5N 0M6 CANADA

**RECOVERY DATA:**
**LOCATION:** WABASCA AB **RECOVERED:** 07/05/2000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1947 1997
SERVICE CANADIEN DE LA FAUNE
BANDING DATA:
BAND NUMBER: 0748-03658
BANDED: 07/04/1984
SPECIES: DBL-CRST CORMORANT
SEX: UNKNOWN
AGE OF BIRD: WAS TOO YOUNG TO FLY WHEN BANDED IN 1984.
LOCATION: NEAR PELICAN LAKE ALTA
BANDER: ALBERTA PROVINCIAL MUSEUM
C/O DR JOCELYN HUDON 12845 102 AVE
EDMONTON AB
T5N 0M6 CANADA
RECOVERY DATA:
LOCATION: WABASCA AB
RECOVERED: 07/05/2000

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(as of July 2001)

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